

การพัฒนาเยื่อผิวหนังเทอร์บูทาลีนซัลเฟตโดยใช้
โคโคแซน และอนุพันธ์ของ โพลีไวนิล เป็นเมทริกซ์ที่มีคุณสมบัติยึดติดผิวหนัง

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DEVELOPMENT OF TERBUTALINE SULFATE TRANSDERMAL PATCH
BY USING
CHITOSAN AND POLYVINYL DERIVATIVES AS ADHESIVE MATRICES

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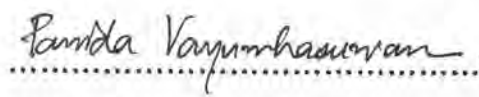

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สิริกาญจน์ ปริศวงศ์: การพัฒนายาแปะผิวหนังเทอร์บูทาลีนซัลเฟต โดยใช้ไคโตแซน และอนุพันธ์ของโพลีไวนิล เป็นเมทริกซ์ที่มีคุณสมบัติยึดติดผิวหนัง (DEVELOPMENT OF TERBUTALINE SULFATE TRANSDERMAL PATCH BY USING CHITOSAN AND POLYVINYL DERIVATIVES AS ADHESIVE MATRICES) อ. ที่ปรึกษา: รศ. ดร. กาญจน์ทิมา ดุทธิเดช, 184 หน้า, ISBN 974-331-196-3.

การพัฒนายาแปะผิวหนังเทอร์บูทาลีนซัลเฟต โดยใช้ไคโตแซน และอนุพันธ์ของโพลีไวนิล เป็นเมทริกซ์ที่มีคุณสมบัติยึดติดผิวหนัง อนุพันธ์ของโพลีไวนิลที่เลือกใช้คือ โพลีไวนิลแอลกอฮอล์ และโพลีไวนิลไพโรโรลิโคน เค 90 ในการศึกษาขั้นต้น พบว่าสามารถเตรียมแผ่นแปะผิวหนังที่มีคุณสมบัติยึดติดผิวหนัง โดยใช้ไคโตแซนผสมกับ โพลีไวนิลไพโรโรลิโคน เค 90 และมีกลีเซอรินเป็นพลาสติกไซเซอร์ นำสูตรตำรับที่มีลักษณะทางกายภาพดี และยึดติดผิวหนัง มาเตรียมเป็นยาแปะผิวหนัง เทอร์บูทาลีนซัลเฟต การประเมินคุณสมบัติทางเคมีฟิสิกส์ของยาแปะผิวหนังที่เตรียมได้ ประกอบด้วยคุณสมบัติทางกายภาพ การดูดความชื้น คุณสมบัติเชิงกล คุณสมบัติยึดติดผิว คุณสมบัติเกี่ยวกับความร้อน และศึกษา การซึมผ่านผิวหนังในหลอดทดลอง โดยใช้คราบง พบว่ายาแปะผิวหนังที่เตรียมได้มีคุณสมบัติทางกายภาพ การดูดความชื้น คุณสมบัติเชิงกล คุณสมบัติยึดติดผิว และคุณสมบัติเกี่ยวกับความร้อน แตกต่างกัน ซึ่งอาจเป็นผลมาจากความแตกต่างกัน ในส่วนประกอบของตำรับ คือ น้ำหนักโมเลกุล และปริมาณของไคโตแซน และปริมาณของโพลีไวนิลไพโรโรลิโคน เค 90 ทำให้มีผลต่อการซึมผ่านผิวหนังของยา การควบคุมการซึมผ่านผิวหนังของเทอร์บูทาลีนซัลเฟตเป็นการควบคุม โดยการแพร่ผ่าน โครงสร้างของเมทริกซ์ที่มีคุณสมบัติยึดติดผิวหนัง สรุปว่ายาแปะผิวหนังเทอร์บูทาลีนซัลเฟตชนิด ควบคุมโดยเมทริกซ์ โดยใช้ไคโตแซนผสมกับโพลีไวนิลไพโรโรลิโคน เค 90 และกลีเซอริน ความเข้มข้นร้อยละ 10 โดยน้ำหนัก เพื่อเพิ่มประสิทธิภาพในการยึดติดผิวหนัง สามารถให้การซึมผ่านของตัวยา 1.202 ไมโครกรัม/ชั่วโมง/ตารางเซนติเมตร

ภาควิชา..... เกษษอุตสาหกรรม
สาขาวิชา..... เกษษอุตสาหกรรม
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ลายมือชื่อนิสิต..... สิริกาญจน์ ปริศวงศ์
ลายมือชื่ออาจารย์ที่ปรึกษา.....
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

#3972064733 : MAJOR MANUFACTURING PHARMACY

KEY WORD ADHESIVE MATRIX TYPE/ TRANSDERMAL FILM/ TERBUTALINE SULFATE/ CHITOSAN

SIRIKARN PRISAWONG : DEVELOPMENT OF TERBUTALINE SULFATE TRANSDERMAL PATCH BY USING CHITOSAN AND POLYVINYL DERIVATIVES AS ADHESIVE MATRICES. THESIS ADVISOR : ASSOC. PROF. GARNPIMOL C. RITTHIDEJ, Ph.D. 184 pp. ISBN 974-331-196-3.

Terbutaline sulfate transdermal patch was developed by using chitosan and polyvinyl derivatives as adhesive matrices. Selected polyvinyl derivatives used in this experiment were polyvinyl alcohol and polyvinylpyrrolidone K-90. In preliminary study, transdermal patches with adhesive property were prepared by using chitosan and polyvinylpyrrolidone K-90 blend. Glycerin was used as a plasticizer. The formulations, which produced good physical characteristics and adhesiveness, were selected for preparing terbutaline sulfate transdermal patch. The physicochemical properties of terbutaline sulfate transdermal patches, which composed of physical, moisture absorption, mechanical, adhesive and thermal properties, were evaluated. *In-vitro* skin permeation study was also evaluated by using shed snake skin. The difference in physicochemical properties was affected by the molecular weight and amount of chitosan and amount of polyvinylpyrrolidone K-90, thus in turn affected the drug permeation through shed snake skin. The skin permeation of terbutaline sulfate was controlled by diffusion through structure of adhesive matrix. It can be summarized that matrix controlled terbutaline sulfate transdermal patch using chitosan blended with polyvinylpyrrolidone K-90 and glycerin in a concentration of 10 %w/w to increase adhesiveness could exhibit 1.202 $\mu\text{g/hr/cm}^2$ of drug permeation.

ภาควิชา..... เกษษุศตสาหกรรม
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ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

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LIST OF ABBREVIATIONS

°C	degree celsius
cm	centimeter (s)
cm ²	square centimeter (s)
CS	chitosan
DSC	differential scanning calorimetry
e.g.	exempli gratia, for example
et al.	et alii, and others
FT-IR	fourier transform infrared
g	gram (s)
HPLC	high performance liquid chromatography
hrs	hours
i.e.	id est, that is
IR	infrared
kg	kilogram (s)
kV	kilovolt (s)
M	molar
mA	milliampere (s)
mg	milligram (s)
min	minute (s)
ml	milliliter (s)
mm	millimeter (s)
mPa.s	millipascal second
N	normality
ng	nanogram (s)

nm	nanometer (s)
pH	the negative logarithm of the hydrogen ion concentration
PSA	pressure-sensitive adhesive
psi	pound per square inch
PVA	polyvinyl alcohol
PVP K-90	polyvinylpyrrolidone K-90
q.s.	make to volume
r^2	coefficient of correlation
%RH	percentage of relative humidity
rpm	revolution per minute
SD	standard deviation
SEM	scanning electron microscope
μg , mcg	microgram (s)
μl	microliter (s)
μm	micrometer (s)
UV	ultraviolet
v/v	volume by volume
wt	weight
w/w	weight by weight
%	percentage
°	degree